- 5 Lindgren L, Yli-Hankala A, Randell T, Kirvelä M, Scheinin M, Neuvonen PJ. Haemodynamic and catecholamine responses to induction of anaesthesia and tracheal intubation: comparison between thiopentone and propofol. *Br J Anaesth* 1993; 70: 306–10.
- 6 Goodchild CS, Serrao JM. Cardiovascular effects of propofol in the anaesthetized dog. *Br J Anaesth* 1989; 63: 87–92.

REPLY

The reports by Gin *et al.*^{1,2} recommended the use of propofol as a hypnotic agent for rapid sequence intubation at Caesarian section. Their study objectives were to determine aspects of neonatal and maternal safety of propofol as an induction agent. The general objective in our investigations³ was to evaluate the efficacy of two approaches to prevent propofol-induced hypotension in non-pregnant patients who have significantly different haemodynamic profile compared to pregnant ladies.

The problem with rapid sequence intubation with propofol is not the induced-hypotension after 2–3 min which was eluded to by Dr. Gin in his letter. This immediate decrease in blood pressure is antagonised by several factors i.e., laryngoscopy and orotracheal intubation. In fact, the delayed-onset hypotension that we reported, particularly before surgical stimulation, is the clinically significant adverse effect of propofol induction and may greatly jeopardise vital organ perfusion. Such delayed hypotension could be adequately prevented by crystalloid pre-loading and not by pre-induction ephedrine administration.³

We agree with Dr. Gin that propofol is a useful agent for rapid sequence induction of anaesthesia and volume loading is a crucial component of the technique.

Hossam El-Beheiry MBBCh PhD FRCPC
The Toronto Hospital, Western Division
Department of Anaesthesia
399 Bathurst Street
Toronto, Ontario, Canada M5T 2S8

REFERENCES

- 1 Gin T, Gregory MA, Oh TE. The haemodynamic effects of propofol and thiopentone for induction of Caesarean section. *Anaesth Intensive Care* 1990; 18: 175–9.
- 2 Gin T, O'Meara ME, Kan AF, Leung RK, Tan P, Yau G. Plasma catecholamines and neonatal condition after induction of anaesthesia with propofol or thiopentone at Caesarian section. *Br J Anaesth* 1993; 70: 311–6.
- 3 El-Beheiry H, Kim J, Milne B, Seegobin R. Prophylaxis against the systemic hypotension induced by propofol during rapid-sequence intubation. *Can J Anaesth* 1995; 42: 875–8.

Omeprazole before emergency Caesarean section

To the Editor:

I would like to respond to the suggestion made by Tripathi *et al.*¹ that further studies should be carried out with combinations of oral antacids, iv metoclopramide and iv omeprazole

before emergency Caesarean section. We have performed such a study in 384 patients and although the final manuscript is in press,² preliminary results have been published elsewhere.³ In summary, metoclopramide did not reliably reduce gastric volume when added to sodium citrate, sodium citrate and ranitidine, or sodium citrate and omeprazole, although the lowest median volumes were from groups receiving triple therapy (citrate, metoclopramide and either ranitidine or omeprazole). We did not find omeprazole to be better than ranitidine.

One important difference between our study and that of Tripathi *et al.* was the treatment time – the time elapsed between drug administration (the time the decision is made for emergency surgery) and aspiration of gastric contents. In our study, this time was usually <30 min, and often the time from drug administration to induction of anaesthesia would be <15 min. Intravenous ranitidine and omeprazole may require 30–40 min to have an appreciable effect and they are less useful when urgent surgery is necessary. Tripathi *et al.* had mean treatment times of 67–70 min, implying that there was no urgent fetal distress in most of their patients. With over 30 min advance warning, regional anaesthesia would have been an alternative to general anaesthesia.

Recently, I corresponded with Drs Rocke and Rout⁴ who have had extensive experience with iv omeprazole and ranitidine.^{5,6} Our respective studies have led us both to use routinely only sodium citrate before emergency Caesarean section. We are not convinced that intravenous metoclopramide will reduce gastric volume in the time available and, if acid suppression is indicated, we would prefer intravenous ranitidine to omeprazole.⁴

T Gin FRCA FANZCA MD
Department of Anaesthesia and Intensive Care
Prince of Wales Hospital
Chinese University of Hong Kong
Shatin, Hong Kong

REFERENCES

- 1 Tripathi A, Somwanshi M, Singh B, Bajaj P. A comparison of intravenous ranitidine and omeprazole on gastric volume and pH in women undergoing emergency Caesarean section. *Can J Anaesth* 1995; 42: 797–800.
- 2 Stuart JC, Kan AF, Rowbottom SJ, Yau G, Gin T. Acid aspiration prophylaxis for emergency Caesarean section. *Anaesthesia* 1996; 51: 415–21.
- 3 Gin T, Stuart JC, Kan AF, Rowbottom SJ, Yau G. IV ranitidine or omeprazole for emergency Caesarean section (Abstract). *Anaesth Intensive Care* 1994; 22: 483.
- 4 Gin T. Intravenous omeprazole before emergency caesarean section (Letter). *Anesth Analg* 1995; 80: 848–9.
- 5 Rout CC, Rocke DA, Gouws E. Intravenous ranitidine reduces the risk of acid aspiration of gastric contents at emergency caesarean section. *Anesth Analg* 1993; 76: 156–61.
- 6 Rocke DA, Rout CC, Gouws E. Intravenous administration of the proton pump inhibitor omeprazole reduces the risk of acid aspiration at emergency caesarean section. *Anesth Analg* 1994; 78: 1093–8.

REPLY

The increase in gastric pH in our patients receiving iv omeprazole was similar to that of patients receiving iv omeprazole, metoclopramide and oral sodium citrate in a